ROZOVSKIY, L.B.

Work of the Odessa State University on Kakhovka Reservoir in 1956-1957. Trudy Okean.kom. 8:211-216 '61. (MIRA 14:5)

1. Odesskiy gosudarstvennyy universitet.
(Kakhovka Reservoir--Beach erosion)

ROZOVSKIY, L.B.

Practice in using physical similitude theory in engineering geology. Izv. vys. ucheb. zav.; geol. i razv. 7 no.4:111-121 Ap '64. (MIRA 18:3)

1. Odesskiy gosudarstvennyy universitet.

ROZOVSKIY, L.B.

Using natural analogs and electronic computers for predicting modern geological processes. Razved. i okh. nedr 31 no.4:47-50 Ap '65. (MIRA 19:1)

1. Odesskiy gosudarstvennyy universitet.

REPIN, A.A.; ROZOVSKIY, L.D.

Wear and heat resistant products of enriched slag. Stroi. mat. 11 no.7:11-13 Jl '65. (MIRA 18:8)

ROZOVSKIY, L.D., inzh.; REPIN, A.A., kand. tekhn. nauk; FISARENKO, A.A., inzh.

Floor coverings of cast slag tiles. Prom. stroi. 42 no.10:46-48 O '64. (MIRA 17:11)

ZIL'BER, Motel' Kushevich, kand. tekhn. nauk; ROZOVSKIY, Leonid Davidovich, inzh. Prinimali uchastiye: GLADOVSKAYA, T.K., inzh.; KOSTINA, T.M., inzh.; MARCHENKO, A.A., inzh., laureat Leninskoy premii, retsenzent; OSTROUKHOV, M.Ya., kand. tekhn. nauk, red.; SVET, Ye.B., red.

[Slag pumice] Shlakovaia pemza. Cheliabinsk, IUzhno-Ural'skoe knizhnoe izd-vo, 1964. 103 p. (MIRA 18:7)

ROZOVSKIY, L.D., inzh.

[Production of slag pumice by jet equipment; from practices of the "Magnitostroi" Trust]Proizvodstvo shlakovoi pemzy struinymi apparatami; iz opyta tresta "Magnitostroi." Moskva, Gos.izd-vo lit-ry po stroit., arkhit.i stroit.materialam, 1961. 49 p. (MIRA 14:11)

1.Akademiya stroitel'stva i arkhitektury SSSR.Institut organizatsii, mekhanizatsii i tekhnicheskcy pomoshchi stroitel'stvu.Byuro tekhnicheskoy informatsii. 2. Rukovoditel' laboratorii litykh i profilirovannykh shalkovykh izdeliy Ural'skogo filiala Akademii stroitel'stva i arkhitektury SSSR (for Rozovskiy).
(Pumice) (Slag) (Porous materials)

ROZOVSKIY, L.D.; REPIN, A.A.

Efficient technology of the production of cast slag tiles.
Stroi. mat. 9 no.7:4-5 Jl '63. (MIRA 16:11)

ROZOVSKIY, L.D., inzh.; MISHURIS, A.I., inzh.; KOLOMIYETS, V.A., inzh.

Jet apparatus for making slag pumice. Stroi.mat. 6 no.4: 17-19 Ap '60. (MIRA 13:6)
(Slag) (Jets--Fluid dynamics)

ROZOVSKIY, L.D., inzhener; MISHURIS, A.I., inzhener; CHERDYNTSEV, D.V., inzhener.

Making slag pumice in a centrifugal apparatus. Stroi.prom. 32 no.5:36-39 My '54. (MLRA 7:6)

1. Trest Magnitostroy. (Slag cement)

ROZOVSKIY, L.B., kandidat geologo-mineralnykh nauk.

Rebuilding the shore line of a reservoir after 10 years of operation.
Gidr.stroi. 23 no.2:23-25 '54. (MLRA 7:4)
(Reservoirs)

15-57-5-6878

Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 5, p 165 (USSR)

AUTHOR: Rozovs~~kiy, L. B.~~

TITLE: Hydrological Features and Classification of Alluvial Streams (Nekotoryye osobennosti gidrogeologicheskoy kharakteristiki i klassifikatsiya allyuvial'nykh potokov).

PERIODICAL: Sb. geol-geogr. f-ta (Odes. un-t), Vol 2, 1954, pp 31-47.

ABSTRACT: Bibliographic entry

Card 1/1

NIKITIN, Ivan Kuz'mich; ROZOVSKIY, L.I., doktor tekhn.nauk, otv. red.; LISOVETS, A.M., tekhn. red.

[Turbulent channel flow and processes in the bottom area], Turbulentnyi ruslovoi potok i protsessy v pridonnoi oblasti. Kiev, Izd-vo AN Ukr.SSR, 1963. 141 p. (MIRA 16:8)
(Hydraulics)

BONDAROVICH, A.G., KURTO, I.P., ROZOVSKIY, L.N.

Treating pemphigus with rabies vaccine. Sbor.nauch.rab.Bel.nauch.-issl.kozhno-ven.inst. 4:73-77 '54 (MIRA 11:7)
(PEMPHIGUS)
(RABIES)

ROZOVSKIY, L.N.

Taratynov's disease, eosinophil granuloma. Sbor.nauch.rab. Bel.
nauch.-issl.kozhno-ven.inst. 4:101-105 '54 (MIRA 11:7)
(SKIN--TUMORS)

ROZovskiy, L.N.

5

USSR/Pharmacology and Toxicology. Chemotherapeutic Preparations V-7
Antibiotics

Abs Jour : Ref Zhur - Biol., No 15, 1958, No 71286

Author : Prokopchuk A.Ya., Chernomortseva N.I., Bondarovich A.G., Karpovich Ye.A., Tselisheva A.D., Margolina S.Yu., Ruytsina N.A., Rozovskiy L.N.

Inst : Belorussian Scientific Research Dermatovenereal Institute

Title : The So-Called Candida Mycoses Enterites and Nephritos Occurring During Treatment with Antibiotics.

Orig Pub : Sb. nauchn. rabot. Belorussk. n.-i. kozhno-venerol. in-t, 1957, 5, 307-318

Abstract : No abstract

Card : 1/1

ROZOVSKIY, L.N.

Taratynov's disease, eosinophilic granuloma. Vest. ven i derm. no.4: 25-27 Jl-Ag '54. (MLRA 7:8)

1. Iz Belorusskogo koshno-venerologicheskogo instituta (dir. deystvitel'nyy chlen Akademii nauk BSSR prof. A.Ya.Prokopchuk)
(EOSINOPHILIC GRANULOMA,
*clin. aspects)

ROZOVSKIY, L.N.

Case of an abortive form of gangrene. Sbor.nauch.rab.Bel.nauch.-issl.
Kozhno-ven.inst. 6:385-386 '59. (MIRA 13:11)
(BUTTOCKS--DISEASES)
(GANGRENE)

SMIRNOV, R.O. [Smyrnov, R.O.], student geol.-geograf.fakul'teta;
ROZOVSKIY, L.B. [Rozovs'kyi, L.B.], nauchnyy rukovoditel', dots.

Empiric formula for predicting shoreline erosion of reservoirs during the first years of their operation (under conditions similar to those at Kakhovka Reservoir). Pratsi Od.un. Zbir. stud.rob. 149 no.5:145-147 '59. (MIRA 13:4)

1. Odesskiy gosudarstvennyy universitet.
(Reservoirs) (Beach erosion)

VAAG, Leonid Aleksandrovich; ZAKHAROV, Stanislav Nikolayevich;
ROZOVSKIY, L.Ya., red.; YEMZHIN, V.V., tekhn. red.

[Methods for economic valuation in power engineering]Metody ekonomicheskoi otsenki v energetike. Moskva, Gosenergoizdat, 1962. 271 p. (MIRA 15:9)
(Power engineering—Costs)

CHERNYAVSKIY, Vasiliy Osipovich; ROZOVSKIY, L.Ya., red.; PONOMAREVA, A.A., tekhn. red.

[Problems in the methodology for calculating the effectiveness of capital investments] Voprosy metodiki raschetov effektivnosti kapital'nykh vlozhenii. Moskva, Gos. izd-vo planovo-ekon. lit-ry, 1961. 65 p. (MIRA 14:10)

1. Glavnyy spetsialist Gosudarstvennogo ekonomicheskogo soveta SSSR (for Chernyavskiy).
(Capital investments)

VAAG, Leonid Aleksandrovich, kand. tekhn. nauk; ROZOVSKIY, L.Ya., red.; MISHNAYEVSKAYA, G.V., mlad. red.; GERASIMOVA, Ye.S., tekhn. red.

[Improve economic methods for the administration of the national economy] Sovershenstvovat' ekonomicheskie metody upravleniia narodnym khoziaistvom. Moskva, Izd-vo "Ekonomika," 1964. 91 p. (Obsuzhdaem problemy sovershenstvovaniia planirovaniia, no.4) (MIRA 17:3)

IVANOV, Yevgeniy Aleksandrovich; ROZOVSKIY, L.Ya., red.;
MISHNAYEVSKAYA, G.V., mlad. red.; PONOMAREVA, A.A.,
tekhn. red.

[Planning the efficient utilization of capital assets]
Planirovanie effektivnosti ispol'zovaniia osnovnykh
fondov. Moskva, Ekonomizdat, 1963. 190 p.
(MIRA 17:1)

(Capital)

GLUSKER, Boris Yakovlevich; ROZOVSKIY, L.Ya., red.; MISHNAYEVSKAYA, G.V., mladshiy red.; GERASIMOVA, Ye.S., tekhn. red.

[Methodology for computing plan indices; problems of improving the index system] Metodologiia postroeniia pokazatelei plana; voprosy sovershenstvovaniia sistemy pokazatelei. Moskva, Ekonomizdat, 1963. 149 p. (MIRA 17:1)

BATSANOV, B.T.[translator]; GERTSOVICH, G.B.[translator]; ROZOVSKIY, L.Ya.[translator]; BRODSKIY, Ye.A., red.; LEBEDINSKAYA, L.N., red.; DZHATIYEVA, F.Kh., tekhn. red.

[National economy of the German Democratic Republic; 15 years of peaceful development] Narodnoe khoziaistvo GDR; 15 let mirnogo razvitiia. Moskva, Izd-vo inostr. lit-ry, 1961. 509 p. Translated from the German. (MIRA 15:3)

(Germany, East--Economic conditions)

KRUSH, I.I. (Dnepropetrovsk); ROZOVSKIY, M.I. (Dnepropetrovsk)

Solution of the problem of nonlinear vibrations in the presence of an elastic residual effect. Izv. AN SSSR. Mekh. no.5:127-129 S-O '65. (MIRA 18:10)

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2544

538.3

Electromagnetic Field Equations for a Conducting Medium with Hysteresis. — M. Rozovski. (*Zh. eksp. teor. Fiz.*, 1941, Vol. 11, ~~Nos. 10/11,~~ pp. 402-406.) In Maxwell's equations, it is usually assumed that $B(z, t) = \mu H(z, t)$. If, however, the magnetic lag is taken into account, the latter formula must be so modified as to reflect the dependence of $B(z, t)$, not only on the value of $H(z, t)$ at the given moment, but also on the states of $H(z, t)$ preceding this moment. Using the relationship (3) between $B(z, t)$ and $H(z, t)$, introduced by Volterra, an integral-differential equation (11) of a more general character is derived from Maxwell's equations. It is shown that this equation can be solved by the Fourier method.

ROZOVSKY, M. I.

Rozovsky, M. I. Propagation of the electromagnetic field in dielectrics with a dielectric afteraction and in conductors with a magnetic afteraction. Akad. Nauk SSSR. Zhurnal Eksper. Teoret. Fiz. 16, 856-869 (1946). (Russian. English summary)

Source: Mathematical Reviews, Vol 8 No. 6

ROZOVSKIY, M. I.

Rozovskii, M. I. On the problem of analytic representation of the deformation processes of structures composed of visco-elastic elements. Bull. Acad. Sci. URSS. Cl. Sci. Tech. [Izvestia Akad. Nauk SSSR] 1947, 301–305 (1947). (Russian)

Integro-differential stress-strain relations for visco-elastic materials exhibiting after-effect are established and applied to the lateral vibrations of a beam which is made of such a material and rests on a visco-elastic foundation likewise exhibiting after-effect. *W. Prager* (Providence, R. I.).

Source: Mathematical Reviews, Vol No. 10

ROZOVSKIY, M. I.

PA 21T79

USSR/Mathematics, Applied
Elasticity

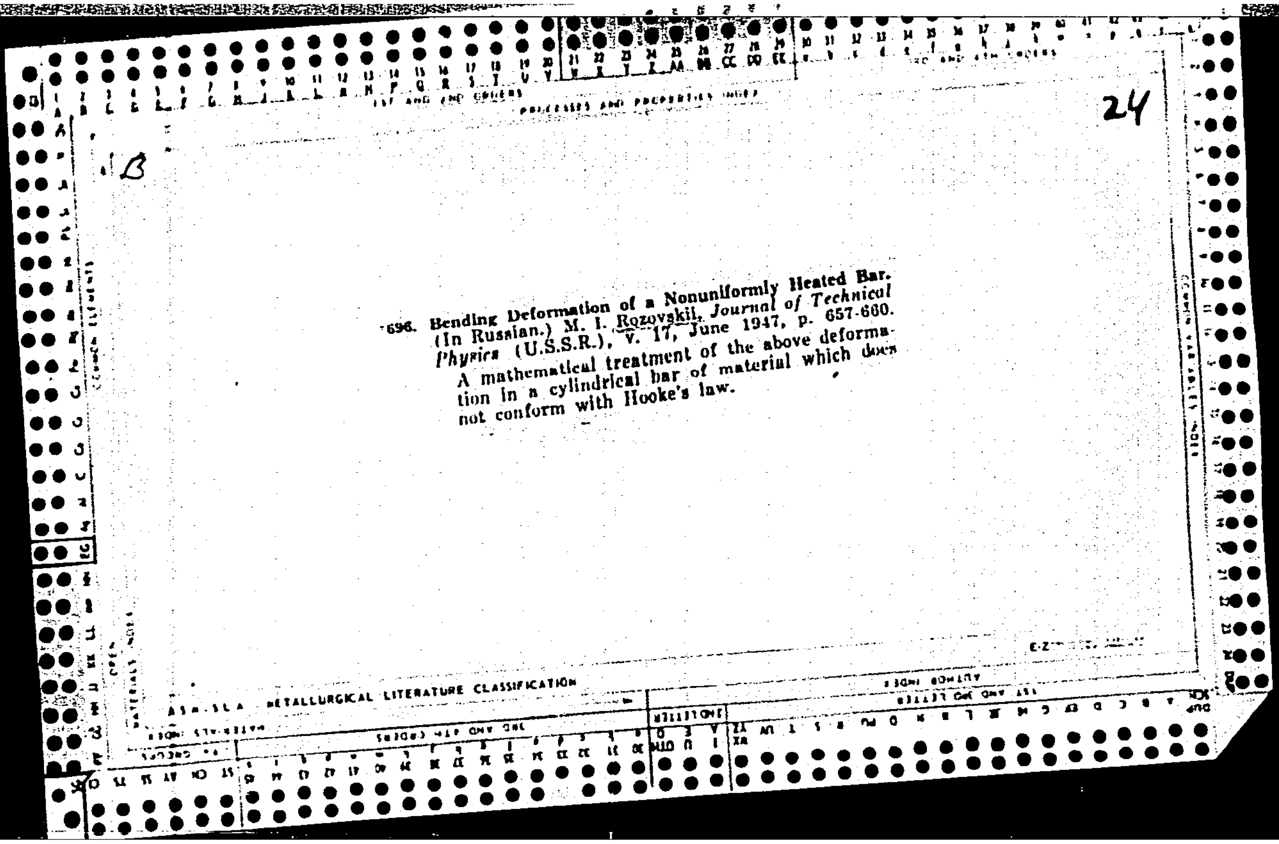
Mar 1947

"The Application of Integral-Differential Equations to Dynamic Problems Found in the Theory of Elasticity in the Case of After-effect," M.I.Rozovskiy, 10 pp

"Prikladnaya Matematika i Mekhanika" Vol XI, No 3

The transverse oscillations of a bar in the presence of after-effect are studied in the form of $X_1T_1 + X_2T_2 + \dots$. The function $T_n = T_n(+)$ is solved. A practical example is taken of radial oscillations in a hollow ball and oscillations in a free-supported plate.

21T79



PROCESSES AND PROPERTIES INDEX

1B

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696. **Bending Deformation of a Nonuniformly Heated Bar.** (In Russian.) M. I. Rozovskii. *Journal of Technical Physics* (U.S.S.R.), v. 17, June 1947, p. 657-660.

A mathematical treatment of the above deformation in a cylindrical bar of material which does not conform with Hooke's law.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

ROZOVSKIY, M.I. (Dnepropetrovsk)

Note on a certain class of functions and their application. Zhur. vych. mat. i mat. fiz. 2 no.1:179-185 Ja-F '62. (MIRA 15:3)
(Functional analysis)

ROZOVSKIY, M.I.

Rozovskii, M. I. Plane deformations in the presence of elastic after-effects and thermal stresses. Doklady Akad. Nauk SSSR (N.S.) 58, 999-1002 (1947). (Russian)

The author generalizes the Hooke-Volterra stress-strain relations in a long homogeneous isotropic elastic cylinder by including terms accounting for the thermal stresses. He is led to an integro-differential equation for the displacements, which is solved in terms of the resolvents of certain kernels.

I. S. Sokolnikoff (Los Angeles, Calif.).

Source: Mathematical Reviews, Vol 7 No. 6

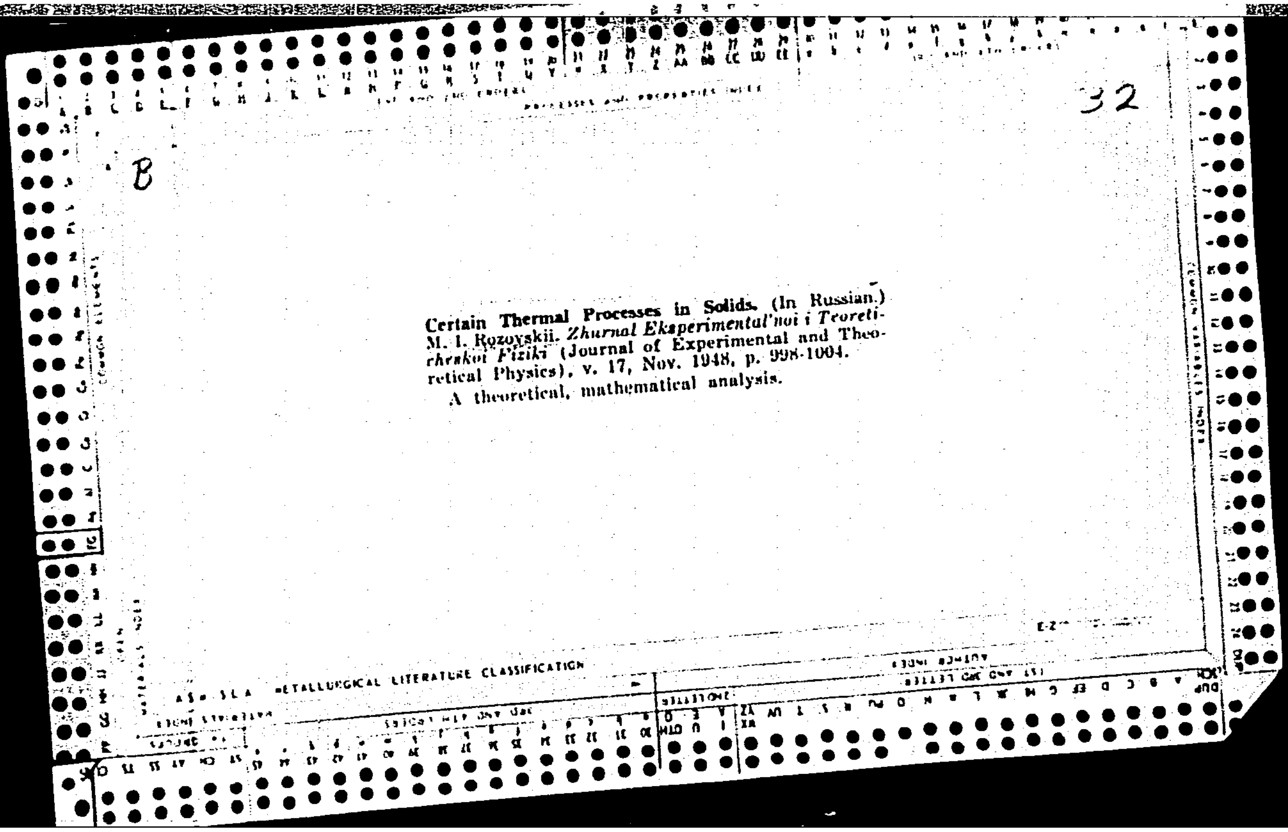
ROZOVSKIY, M.I.

Rozovskii, M. I. The application of integral and integro-differential equations to the study of the deformation processes of real materials. Izvestiya Akad. Nauk SSSR. Otd. Tehn. Nauk 1948, 601-622 (1948). (Russian)

Using the Boltzmann-Volterra theory of elastic after-effect, the author treats longitudinal, transverse and torsional vibrations of prismatic or cylindrical bars.

W. Prager (Providence, R. I.).

Source: Mathematical Reviews, Vol 10, No. 1



32

B

Certain Thermal Processes in Solids. (In Russian.) M. I. Rozovskii. *Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki* (Journal of Experimental and Theoretical Physics), v. 17, Nov. 1948, p. 998-1004.

A theoretical, mathematical analysis.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

ROZOVSKIY, M. I.

Rozovskiy, M. I. - "Deformation processes in elastic materials," Izvestiya Dnepropetr. gornogo in-ta, Vol. XIX, 1948, p. 187-204

SO: U-3600, 10 July 53, (Letopis, 'Zhurnal 'nykh Statey, No. 6, 1949).

ROZOVSKIY, M. I.

Rozovskiy, M. I.,- "The dynamic tasks of the theory of elasticity in the presence of after-effects", Izvestiya Dnepropetr. gornogo in-ta im. Artema, Vol. XX, 1948, p. 175-92, Bibliog: 7 items.

SO: U-4631, 16 Sept. 53, (Letopis 'nykh Statey, No. 24, 1949).

ROZOVSKIY, M. I.

Rozovskiĭ, M. I. On the integro-differential telegraph equations. Doklady Akad. Nauk SSSR (N.S.) 59, 1265–1268 (1948). (Russian)

The author considers the pair of integro-differential equations

$$\frac{\partial V}{\partial x}=RJ+L\frac{\partial J}{\partial t}+\int_{-\infty}^{t}\varphi(t-\tau)\frac{\partial J(\tau)}{\partial\tau}d\tau,$$

$$\frac{\partial J}{\partial x}=GV+C\frac{\partial V}{\partial t}+\int_{-\infty}^{t}\psi(t-\tau)\frac{\partial V(\tau)}{\partial\tau}d\tau,$$

satisfied by the potential V and the current J in a long thin conductor when electromagnetic after-effects are taken into account. He obtains a complete solution for the forced oscillations induced by an applied periodic e.m.f., and then considers the transient effects arising when a constant e.m.f. is suddenly applied. In the latter case he assumes that the transient part of the potential can be expressed in the form

$$V_2(x,t)=\sum_{k=1}^{\infty}T_k(t)\sin(k\pi x/l),$$

and shows that the functions $T_k(t)$ satisfy an integro-differential equation of the form

$$a_1\frac{d^2T_k}{dt^2}+a_2\frac{dT_k}{dt}+\left(\frac{k^2\pi^2}{l^2}+a_3\right)T_k$$
$$+\int_0^t\left\{\psi_1(t-s)\frac{d^2T_k(s)}{ds^2}+\psi_2(t-s)\frac{dT_k(s)}{ds}\right\}ds=0.$$

He then states, with an outline proof, that the general solution of this can be written

$$T_k(t)=e^{-bt}[A_1U_1(t,k^2\pi^2/l^2)+A_2U_2(t,k^2\pi^2/l^2)],$$

where U_1 and U_2 are functions for which explicit formulae are given in terms of certain kernels and their resolvents. The paper concludes with explicit formulae for the potential and the current. *F. Smithies* (Cambridge, England).

Source: Mathematical Reviews, Vol 9 No. 10

PA47T97

ROZOVSKIY, M. I.

USSR/Physics
Ferromagnetism
Electromagnetism

Mar 1948

"Electromagnetic Processes with Magnetic Viscosity," M. I. Rozovskiy, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LIX, No 8

Describes experiments on ferromagnetic core possessing magnetic viscosity and situated in self-induction coil included in the circuit with a resistance. Submitted by Academician B. A. Vbedenskiy, 5 Jan 1948.

47T97

ROZOVSKIY, M. I.

PA 8/49T74

USSR/Engineering
Mechanics
Mathematics, Applied

Jul 48

"Impact of a Cylinder on the Surface of a Medium Whose Mechanical Properties Vary With Time," M. I. Rozovskiy, 4 pp

"Dok Ak Nauk SSSR" Vol LXI, No 1

A perfectly hard, right circular cylinder strikes the surface of a medium whose mechanical properties alter, with initial velocity V_0. Gravity is negligible. It is assumed that the cylinder freely slides along the surface of the medium. Author obtains equations for displacements and tensions occurring in the

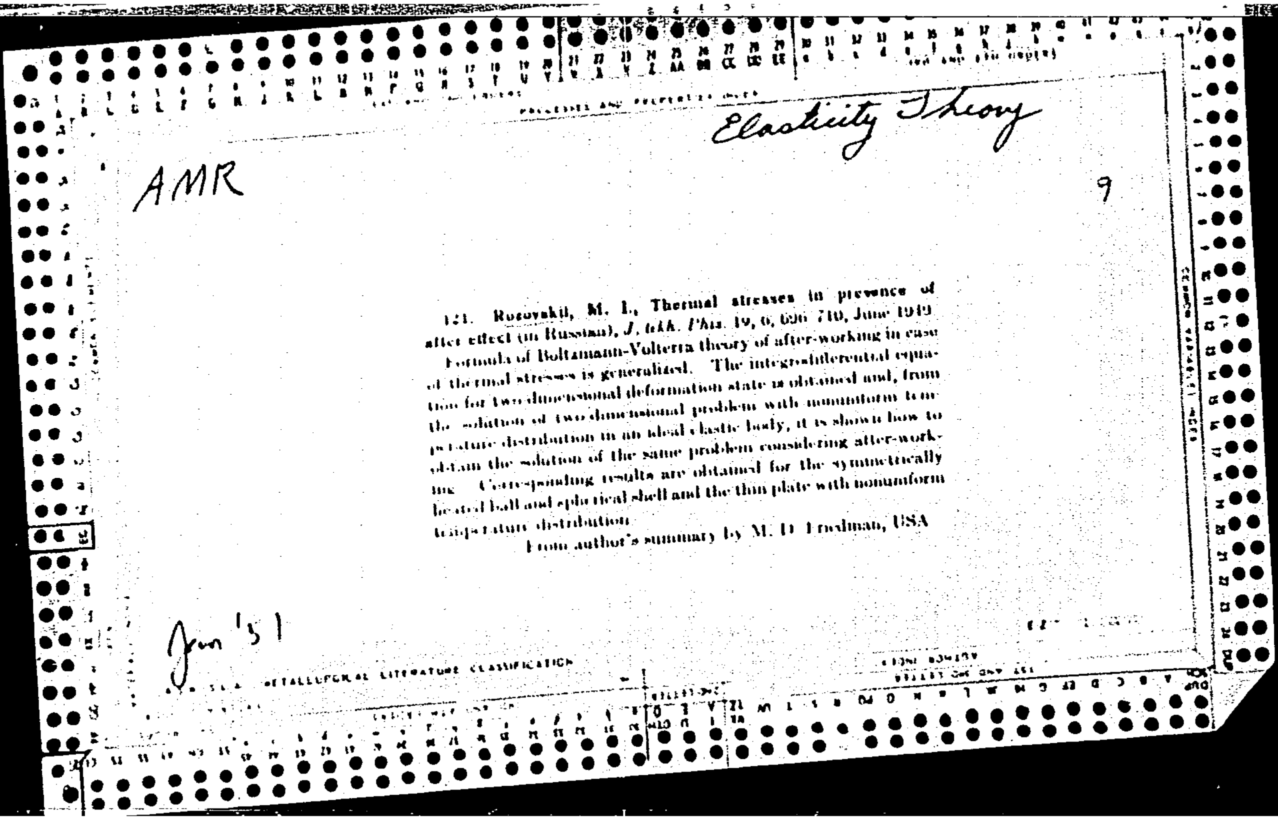
8/49T74

USSR/Engineering (Contd)

Jul 48

support as well as resistance to the blow. Submitted 14 Apr 1948.

8/49T74


PROCESSES AND PROPERTIES INDEX
METALLURGICAL LITERATURE CLASSIFICATION

Elasticity Theory

AMR

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121. **Rozovskii, M. I., Thermal stresses in presence of after effect** (in Russian), *J. tekh. Fiz.* 19, 6, 696-710, June 1949.

Formula of Boltzmann-Volterra theory of after-working in case of thermal stresses is generalized. The integrodifferential equation for two-dimensional deformation state is obtained and, from the solution of two-dimensional problem with nonuniform temperature distribution in an ideal elastic body, it is shown how to obtain the solution of the same problem considering after-working. Corresponding results are obtained for the symmetrically heated ball and spherical shell and the thin plate with nonuniform temperature distribution.

From author's summary by M. D. Friedman, USA

Jun '51

ROZOVSKIY, M. I.

USSR/Engineering - Elasticity of Materials May 52

"Curve of Flow and Elastic Aftereffect," M. I. Rozovskiy, Dnepropetrovsk Order of Labor Red Banner Mining Inst imeni Artiom.

"Zhur Tekh Fiz" Vol XXII, No 5, pp 880-882

Author derives theoretically from the basic integral relation by Volterra (cf. "Theory of Functionals," London, 1931) that if the sample behaves as described by Ivanov (cf. "Limit of Plastic Flow of Wood," 1948) then the characteristic curvature of the flow curve, representing various

222T28

mech states of the material during deformation, depends exclusively on the coeff of the aftereffect and relaxation, expressing the inelastic properties of the material. Received 4 Dec 51.

222T28

ROZOVSKIY,M. I.

USSR/Physics - Plastic non-steady state FD-447

Card 1/1 : Pub. 153 - 17/18

Author : Rozovskiy, M. I.

Title : Equations of nonstationary plasticity with conditional yield point

Periodical : Zhur. tekh. fiz. 24, 752-754, Apr 1954

Abstract : A letter to the editor, in which the author discusses the time processes of nonlinear strain and their representation by two nonlinear integral equations according to two different models; namely, that of Yu. N. Rabotnov for the dependence of elasticity upon strain and that of the author for the dependence of relaxation time upon stress.

Institution : —

Submitted : November 1, 1952

ROZOVSKIY, M.I.

2 may

300. Processes of deformation of materials. M. I. Rozovskii. *Izv. Akad. Nauk Arm. SSR*, 1955, 8, No. 3, 33–9; *Ref. Zhur. Khim.*, 1956, abs. 25877. The deformation of polymers is described with the use of mechanical models in combination with a statistical study. It is assumed that the polymer may form a simple Kelvin model consisting of a number of consecutively united simple elements, the activation energy E of which is described by the distribution function $F(E)$. The process of high-elastic deformation is characterised by the change of the period of elastic after effect with time ($\theta = f^{-1}(t)$). This leads up to establishing $f(t)$ on experimental data. Thus for polyisobutylene at 82°C $f(t) = \alpha t^{-\beta}$ where $\alpha = 0.08$ and $\beta = 0.42$. A similar method may be used to describe stress relaxation. The polymer forms a collection of parallelly united Maxwell elements. The function $\phi(t)$, characterising the rate of relaxation, is determined from experimental data. Thus for smoked sheet at 22° $\phi(t) = at^{-b}$ where $a = 0.07$ and $b = 0.72$. 63424

Matls

FD - 3159

Rozovskiy, M. I.

USSR/Physics - Nonlinear equations of creep

Card 1/1 Pub. 153 - 15/26

Author : Rozovskiy, M. I.

Title : Nonlinear equations of creep and relaxation of materials for complex stressed state

Periodical : Zhur. tekh. fiz., 25, No 13 (November), 1955, 2339-2354

Abstract : In a preceding work (ibid., 21, 11, 1951) the author considered the nonlinear integral relations for the description of mono-axial processes of deformation whose nonlinearity is due to consideration of the independence of instantaneous modulus of elasticity upon degree of deformation and time of relaxation upon stress. In the present work the author proceeds from the same physical assumptions to construct similar dependences for the case of the three-dimensional stressed state, with the Boltzmann-Volterra linear integral equations for an elastic-hereditary medium serving as the original relations to be generalized. The author proposes integral equations described in symbolic form constructively suggesting the equations of the Mises-Il'yushin theory of plastic flow (A. A. Il'yushin, Plastichnost', 1948). The author obtains nonlinear integral equations whose nonlinearity is due exclusively to the influence of the time factor. He indicates the possibility of the construction of equations generalizing the equations of Rabotnov's theory of creep (Yu. N. Rabotnov, Vestnik Mosk. Gos. Univ., 10, 1948). 14 ref.

Submitted : February 8, 1954

ROZOVSKIY, M.I.

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Rozovskiĭ, M. I. Radial vibrations of a hollow sphere with the singular kernel of elastic after-effect. Dokl. Akad. Nauk SSSR (N.S.) 105 (1955), 672–675. (Russian)

Elastic after-effects are taken into account by replacing Lamé's constants λ, μ by $\bar{\lambda}=\lambda(1+\phi^*)$, $\bar{\mu}=\mu(1+\psi^*)$, where ϕ^* is a functional of Volterra's type

$$\phi^* y=\int_0^t \phi(t, \tau)y(\tau)d\tau$$

and ψ^* is similar. An attempt is made to solve the integro-differential equation

$$(\bar{\lambda}+2\bar{\mu})\frac{\partial}{\partial r}\left(\frac{\partial u}{\partial r}+2\frac{u}{r}\right)=\rho\frac{\partial^2 u}{\partial t^2}$$

in the form

$$u(r, t)=\sum T_k(t)\Phi_k(r).$$

The formal work leading to a series for $T_k(t)$ seems to be incorrect.
R. C. T. Smith (Armidale).

Phys

ROZOVSKIY, M.I.

$$\int_0^t \left[\frac{\varphi_{11}(t,\tau)}{A_{11}} \left(\frac{\partial^2 u}{\partial r^2} + \frac{2}{r}\frac{\partial u}{\partial r} \right) - \psi(t,\tau)\frac{u(\tau)}{r^2} \right] d\tau$$

This equation is solved formally by a Neumann series.

R. C. T. Smith (Armidale).

MT

ROZOVSKIY, M.I.

Rozovskii, M. I. **Semisymbolic method of solving certain problems of the theory of creep.** Akad. Nauk Armyan. SSR. Izv. Fiz. Mat. Estest. Tehn. Nauki 9 (1956) no. 5, 43-60. (Russian. Armenian summary)

1-FW

Complex creep cannot be described in terms of a finite number of time dependent parameters. Symbolic solutions [illegible] complex creep problems for [illegible] stress-strain [illegible] given by [illegible] [illegible] Prikl. Mat. Meh. 12 (1948) [illegible] MR 9. [illegible] solutions are obtained from Volterra [illegible] effects [illegible] constants are replaced by [illegible] integral [illegible] special [illegible] time and space variables. Semisymbolic method used by the author of this paper does not require [illegible] introduction of new [illegible]. It can be applied to [illegible] theory (linear stress-strain relation) and also to certain special cases of non-linear theory. The author gives the following solutions of creep problems obtained from the solution of an integro-differential equation: 1) a linear case illustrated on a cylindrical tank under hydrostatic pressure, 2) a non-linear case illustrated on a beam, 3) a dynamic case illustrated on vibrations of an unbounded medium where creep is taken into account.

T. Leser (Aberdeen, Md.)

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1988
AUTHOR ROZOVSKIY,M.I.
TITLE A Semisymbolic Method for the Solution of Some Problems of the Theory of the Elasticity with Consequences.
PERIODICAL Dokl. Akad.Nauk 111, fasc.5,972-975 (1956)
Issued: 1 / 1957

The deformation process of an elastic medium (with aftereffects) is here described as being "complicated" if it cannot be described by a finite number of parameters (which depend only on time). This occurs if the known solution of the corresponding elastic-momentary problem cannot be represented in form of a sum of the products of the coordinate factors with the rational functions of the rational constants. Hitherto the solutions of three problems have been known which correspond to this case.

The semi-symbolic method studied here does not require the previous introduction of a new special function which depends on the coordinates and on time. The present method shows the application of this method to the problems of elasticity with aftereffect; it leads to the solution of the following integral equation:

$$\frac{\partial^m y}{d x^m} + \alpha^2 y\,(x,t) = f(x) + \int_0^t \Psi\,(t,\tau)\,\frac{\partial^m y}{\partial x^m}\,d\tau + \alpha^2 \int_0^t \varphi(t,\tau)\; y\;(x,\tau)\;d\tau$$

Here y denotes an unknown function of x and t; α, f(x) and the coefficients $\varphi(t,\tau)$ and $\Psi(t,\tau)$ are assumed. In the case of m = 4 the above integral equation generalizes the differential equation by A.N.KRYLOV for the beam (?) on

an elastic basis; if m = 4 and in the case of a special form of f(x) the above equation describes the deformation of a closed cylindrical reservoir. Finally, the above equation in the case of m = 2 and $\varphi(t,\tau) = 0$ describes the modification of the longitudinal curvature of a rod in consideration of the aftereffect. The aforementioned special forms of the above equation and also other special cases can easily be derived by basing upon the corresponding physical relations by Volterra (M.I.ROZOVSKIJ, Izv.Akad.Nauk, Otdel.techn.nauk, No 5, (1948)).
The above integral equation is then transformed for further investigation in such a manner that it contains only one kernel. The thus obtained integro-differential equation is represented in symbolic form and is transformed by a further substitution. With a solution ansatz in form of a power series recurrence formulae are obtained. Next, transition from the symbolic to the explicit form is discussed. The solution obtained in this manner is then specialized for the special case: $\Psi(t-\tau) = a(t-\tau)^{\beta-1}$, $a > 0$, $0 < \beta < 1$. On this occasion the coefficient suggested by G.DUFFING, Forsch.2,No 3, 99 (1931) must be experimentally determined. In more complicated cases the solution is determined immediately from a system of algebraic equations which is obtained by making use of the corresponding boundary conditions.

INSTITUTION: Mining Institute DNEPROPETROVSK "ARTEMA".

ROZOVSKIY, M.I. Doc Phys-Math Sci (diss) "Certain aspects of the mechanics of systems which become distorted in time." Dnepropetrovsk, 1957, 23 pp 21 cm. (Mos State Univ im M.V. Lomonosov) 100 copies (KL, 12-57, 103)

ROZOVSKIY, M.I.

Cauchy's problem for integrodifferential equations with partial derivatives in an unlimited space. Usp.mat.nauk 12 no.3:369-376 My-Je '57. (MIRA 10:10)

(Integral equations) (Differential equations, Partial)

PA - 2133

AUTHOR: ROZOVSKIY,M.I.

TITLE: On the Magnetization of Bodies in the presence of Magnetic Viscosity. (O namagnichevanii tel pri nalichii magnitnoy vyazkosti. Russian).

PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 2, pp 355 - 359 (U.S.S.R.) Reviewed: 4 / 1957
Received: 3 / 1957

ABSTRACT: In t 25, 13, 1955, TIKHONOV and SAMARSKIY dealt with the problem of the remagnetization of a conducting cylinder in consideration of magnetic viscosity. The author of this paper is of the opinion that the curve represented in the paper mentioned corresponds neither to the equation of the curve of viscous magnetization nor to the equation concerning the aggregate of exponential functions. A method is therefore suggested here in order to be able to solve the task of magnetizing bodies, in particular cylinders, for any shape of a trial curve of viscous magnetization. First of all, the conception of the element for viscous magnetization dI is introduced. This is a quantity which acts through the magnetic field H during an infinitely short period of time $(\tau, \tau + d\ )$

$$dI = \varphi(t - \tau)\, H(\tau)\, d\tau$$

The factor $\varphi(t - \tau)$ is the function of the influence exercised by magnetic viscosity. It depends on the nature of its surroundings and is experimentally determined. The complete expression for the belated magnetization is obtained by integrating the above

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On the Magnetization of Bodies in the presence if Magnetic Viscositiy.

equation within the limits of $\tau = 0$ to $\tau = t$. By means of this operation the influence exercised by the field H on magnetization during the time preceding the moment is taken into account. The integral equation thus obtained agrees with that obtained by Volterra. If now the constant value H_1 is given to the field H at a certain moment, and if the same is retained during the time that follows, an equation is obtained from which it follows that the influence function $\varphi(t)$ is proportional to the velocity with which the magnitude of viscous magnetization is modified. Thus the form of this function φ may very easily be determined from the curve of viscous magnetization obtained by experiments. In the next chapter the equation for the exponential function $E_\beta(t)$ is derived. This function is the generalization of the ordinary exponential function e^{-a^2t}, which appears in the solution of the corresponding classical task. In order, therefore, to be able to solve the problem of the magnetization of a body while taking viscous magnetization into account, it will be sufficient if, in the corresponding solution of the classical problem, the

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ordinary exponential function is replaced by the one derived here. (2 illustrations).

ASSOCIATION: Mining Institute, Dnepropetrovsk.
PRESENTED BY:
SUBMITTED: 29.3.1956.
AVAILABLE: Library of Congress.

CARD 3/3

Rozovskiy, M. I.

AUTHOR: Rozovskiy, M. I. 57-12-16/19

TITLE: On the Simplification of Nonlinear Integral Equations of Creeping and Relaxation in a Complex Stress State (Ob uproshchenii nelineynykh integral'nykh uravneniy polzuchesti i relaksatsii pri slozhnom napryazhennom sostoyanii).

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1957, Vol. 27, Nr 12, pp. 2791-2792 (USSR)

ABSTRACT: In a previous paper (reference 1) the author proposed to employ non-linear integral equations (1) for the description of the creeping and relaxation processes in a complex stress state. A practical application of these relations in a general case proves to be very difficult. For this reason, a simplification of these relations is given here, starting, just like in the uni-axial case, from the formula by Arrhenius (Arenius). Besides, it is assumed that

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$$\tau = \tau_o e^{\frac{u}{kT}} = \tau_o e^{\frac{u_o - c\sigma_i}{kT}} \qquad (2)$$

On the Simplification of Nonlinear Integral Equations of Creeping and Relaxation in a Complex Stress State 57-12-16/19

u_o, c, k, T, τ_o denoting positive constants of the material in question, and τ denoting the relaxation period. In this formula σ_i is taken to be positive, because the equations (1) are only destined for the description of an active deformation process. The release process follows linear equations, which are obtained on a degeneration of the equations (1) in the case of σ_i being independent of τ. Formula (2) was written down on the assumption, that the reduction of the activation energy u is linearly related to the increase of the intensity of stress σ_i. This corresponds to the result obtained by Gurevich (reference 2) for a uni-axial case. The range of the modification of the relaxation period τ as a function of σ_i at constant temperature T may be divided into three parts: 1) in the range $(0, \sigma_s)$ the equations (1) are linearized, because the relaxation period is independent of σ_s in the case of $\sigma_i < \sigma_s$. 2) In the range (σ_s, σ_p) a complete linearization of these equations with respect to the stress component

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$\sigma_x \sigma_y$ ......, τ_{zx} in a general sense cannot be achieved. By means of the proposed approximation, however, the intensity of stress σ_i will be contained in equation (1) in a linear form. From this it appears, that in cases, where it is possible to reduce the equations to an equation with one unknown σ_i, the problem consists in the solution of an already linear equation. 3) In the range (σ_p σ_b) the equations (1) are: again linearized, but with a correspondingly reduced relaxation period. This is only possible for the reason, that the curve $\tau=\tau(\sigma_i)$ tends towards a straight line and deviates only little from the straight line parallel to the σ_i-axis.
There are 1 figure, and 1 references, 1 of which is Slavic.

SUBMITTED: May 10, 1957

AVAILABLE: Library of Congress

Card 3/3

ROZOVSKIY, M.I

24-58-3-36/38

AUTHOR: Solomonov, M.

TITLE: Elaboration of the Problem of Rock Pressure (K razrabotke problemy gornogo davleniya)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 3, pp 173-174 (USSR)

ABSTRACT: A conference devoted to the phenomena of earth pressure in the rocks surrounding horizontal and vertical workings took place in December 1957 at the Mining Institute of the Academy of Sciences of the USSR. More than 100 representatives of 49 scientific-exploratory bodies, universities and mining enterprises took part in the conference. The conference brought to light problems of theoretical interest related to the distribution of stresses in the rocks, their displacement around the workings and an estimate of pressure upon the timbering of workings - all in line with contemporary notions of the theory of elasticity, plasticity and a creep - flowage. Of exceptional interest among the reports submitted were those which brought to light the role of anisotropy, the problems of an assessment of the creep-flow of rocks and of the influence of the stopping operation upon displacement of

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24-58-3-36/38

Elaboration of the Problem of Rock Pressure.

rocks and exposure of the earth pressure in drifts. The following papers were presented: A. S. Kosmodamianskiy on "An estimate of stressed conditions in an anisotropic massif with the workings within it"; Yu. M. Liberman on "The influence of the time factor revealed by the pressure and displacement of rock in drifts under the influence of stopping operations"; K. V. Ruppeneyt "Pressure and displacement in drifts under the influence of stopping operations"; M. I. Rozovskiy "Methodology of laboratory definition of a creep-flow character of rocks and calculation of the flowage around vertical shafts"; T. S.Yerzhanov "Methodology of a laboratory estimate of the characteristic of flowage of rocks and computation of a creep-flowage around vertical main shafts"; T. A. Kryzhanovskaya "Investigation of the problem of rock pressure upon timbering of horizontal workings based on the theory of viscosity and plasticity of the creep-flow". Of the papers devoted to the investigation conducted under shaft conditions, the conference drew attention to measurements made in the railway tunnels and subways in the Nikopol' Manganese basin and the Donets basin and in the main shafts at great depths. B. N. Vinogradov on "Investigation into the phenomenon of earth pressure in tunnel construction"; A. G. Barlas on "An

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analytical examination of work (behaviour) of timbering in the weak surrounding rocks and measurements of deformations of timbering and the load in the horizontal workings of Nikopol' Manganese basin"; M. A. Komissarov on "The earth pressure around horizontal and inclined workings in connection with the stopping of coal seams under the conditions of the Donets basin"; A. M. Yanchur on "The investigation of the manifestation of earth pressure in vertical shafts of the Donets basin at great depths". The conference expressed its gratitude to the Czechoslovak scientist, Doctor-Engineer Rudol'f Kvapčil for his interesting communication on the theory of earth shocks.

Card 3/3

1. Geology--Conference--USSR

SOV/24-58-9-25/31

AUTHOR: Rozovskiy, M.I.

TITLE: Non-linear Integral Equations of Creep for a Concrete Cylindrical Shell Under the Action of External Pressure (O nelineynykh integral'nykh uravneniyakh polzuchesti betonnoy tsilindricheskoy obolochki, nakhodyashcheysya pod vneshnim davleniyem)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 9, pp 139 - 142 (USSR)

ABSTRACT: The components of the deformation tensor are connected by the non-linear integral equations given in Eq (1). These equations are solved for the stresses σ_r and σ_θ in the case of a thick concrete shell whose creep characteristics are given. The radial stress obtained in this solution is given by Eq (17) and the transverse stress by Eq (18). The corresponding deformations are given by Eq (19). From Eq (17) and Eq (18), it follows that the dependence of the radial and transverse stresses on time is in the first approximation characterised by two time parameters which are determined by the given creep function of concrete. On the other hand, the radial and transverse deformations are characterised by only one time parameter.

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SOV/24-58-9-25/31

Non-linear Integral Equations of Creep for a Concrete Cylindrical Shell Under the Action of External Pressure

There are 3 Soviet references.

SUBMITTED: March 4, 1957

Card 2/2

ROZOVSKIY, M.I.

Applying the method of two-dimensional integral equations to the study of the creep of spherical shells in the case when the physical parameters of the material depend on temperature and time. Izv. AN Arm. SSR. fiz.-mat. nauk 11 no.2:41-50 '58. (MIRA 11:6)

1. Dnepropetrovskiy gornyy institut.
(Creep of metals) (Elastic plates and shells) (Integral equations)

SOV/24-58-12-10/27

AUTHOR: Rozovskiy, M.I. (Dnepropetrovsk)

TITLE: Investigation of the Stress State Around Horizontal Workings in Rock Layers, Allowing for Elastic After-Effect (Izucheniye napryazhennogo sostoyaniya vokrug gorizontal'nykh vyrabotok s uchetom posledeystviya v gornykh porodakh)

PERIODICAL: Izvestiya Akademii Nauk, Otdeleniye Tekhnicheskikh Nauk, 1958, Nr 12, pp 66-72 (USSR)

ABSTRACT: I.V.Rodin (Ref.1) has discussed the effect of horizontal workings on the stress state in rock massives. He assumed, however, that Hooke's law applied but P.T.Sokolov and V.I.Skryabin (Ref.2) and others showed experimentally that the deformation process depends on time and that elastic after-effect should accordingly be taken into account. In the present paper, Rodin's treatment is extended to allow for creep and relaxation. The resulting integral equations are solved to give the stresses and are evaluated in Table 2, using Sokolov and Skryabin's data on the creep of sandstone, limestone and rock-salt in bending and torsion. This table gives the instantaneous and steady coefficients of stress

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Investigation of the Stress State Around Horizontal Workings in Rock Layers, Allowing for Elastic After-Effect

concentrations and displacements and shows that these quantities are considerably modified when time-dependent effects are allowed for. N.Ye.Sorokina assisted with the calculations of Table 2. There are 2 tables and 6 references of which 4 are Soviet, 1 German and 1 English.

ASSOCIATION: Dnepropetrovskiy gornyy institut (Dnepropetrovsk Mining Institute)

SUBMITTED: 23rd October 1957.

Card 2/2

AUTHOR: Rozovskiy, I. I. SOV/20-120-2-11/63

TITLE: Stresses in a Symmetrically Heated Spherical Shell the Mechanical Properties of Which Vary With Time and Temperature (Napryazheniya v simmetrichno nagretoy sfericheskoy obolochke, mekhanicheskiye svoystva kotoroy zavisyat ot vremeni i temperatury)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 2, pp. 265-268 (USSR)

ABSTRACT: A closed spherical shell with the external and internal radii a_1 and a_2 may be free from external forces and initial tensions and the temperature may be distributed uniformly. Starting from a certain instant, the temperature in the shell may become non-uniformly distributed, and the temperature $T = T(r,t)$ is assumed to be known. Tensions and deformations then occur in the shell. The author calculates the radial shift $u(r,t)$ and the tensions which occur in the body mentioned for the case that the Lamé (Lame) coefficients λ and μ and the relaxation coefficients depend on the temperature. The aging (stareniye) of the material (the dependence of λ and μ on t) is taken into account. First, the components of the tensions are expressed

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Stresses in a Symmetrically Heated Spherical Shell the SOV/20-120-2-11/63
Mechanical Properties of Which Vary With Time and Temperature

in spherical coordinates and therefrom the initial integro-differential equation is derived. After carrying out the necessary transformations, a two-dimensional integral equation is obtained. A formula for the shift is then derived and the coefficients contained in this formula may be calculated by means of a system of ordinary integral equations. If the shift u is known, it is possible to determine σ_r, $\sigma_\theta = \sigma_\varphi$. The results found can be simplified considerably by assuming $\lambda=\mu=\lambda_0 e^{-mT}$, $\varphi(t,\tau;r)=\psi(t,\tau;r)=\varphi_0(t,\tau)e^{-mT}$, m denotes a constant of the given material; λ_0 - the Lamé coefficient and $\varphi_0(t,\tau)$ - the relaxation kernel at T = 0. The temperature T is assumed to depend on r and t. The decrease of the physical-mechanical characteristics is proportional to a factor which decreases in an exponential manner with decreasing temperature. This fact was verified also by experiment. The final formula for u is given in an explicit form. As an illustration of the considerations discussed in this paper, the author investigates the case of a hollow shell sphere. The author thanks Yu. A. Ponomarenko and L. I. Paykova for their help in the numerical

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computations. There are 3 references, 2 of which are Soviet.

ASSOCIATION: Dnepropetrovskiy gornyy institut im. Artema (Dnepropetrovsk Mining Institute imeni Artem)

PRESENTED: January 13, 1958, by S. L. Sobolev, Member, Academy of Sciences, USSR

SUBMITTED: May 31, 1957

1. Spherical shells--Mechanical properties 2. Spherical shells --Temperature factors 3. Spherical shells--Stresses

16 (SOV/21-59-6-5/27

AUTHOR: Rozovskiy, M. I.

TITLE: Longitudinal Vibrations of an Elastic-Hereditary Rod with a Singular Action Function

PERIODICAL: Dopovidi Akademii Nauk Ukrains'koi RSR, 1959, Nr 6, pp 587 - 593 (USSR)

ABSTRACT: This is the result of a study of longitudinal vibrations of an elastic-hereditary rod, which arise as a result of a sudden partial unloading of the rod which was in a state of simple creep for some time before unloading. Proceeding from the physical interdependence among deformation ε, tension σ and time t, and using the V. Volterra equation

$$E_0 \varepsilon(t) = \sigma(t) + \int_{t_0}^{t} H(t,\tau)\sigma(\tau)\, d\tau \quad (1)$$

where E_0 is instantaneous elasticity modulus, $H(t,\tau)$ is action function constituting a hereditary characteristic

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SOV/21-59-6-5/27

Longitudinal Vibrations of an Elastic-Hereditary Rod with a Singular Action Function

of a not fully elastic material, the author refers to the works by G. Duffing [Ref. 3] and A. P. Bronskiy [Ref. 4] which prove that the action functions of the previous states are singular of type (2), (3) and (4), and states that the integral equations of (1) type are so flexible that can be successfully applied to allow for numerous peculiarities of hereditary deformation processes. Then the author gets down to examining a process of unstable vibrations. The study is reduced analytically to finding a solution of integral differential equation (9), which reads as follows:

$$\rho^2 \frac{d^2u}{dx^2} = \frac{d^2u}{dt^2} + \int_{t_1}^{t} H(t,\tau)\, \frac{d^2u}{d\tau^2}\, d\tau.$$

with a singular kernel satisfying the initial and boundary conditions (10), (11) and (12). In its final form that solution reads:

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Longitudinal Vibrations of an Elastic-Hereditary Rod with a Singular Action Function

$$u(x,t) = \sum_{n=1}^{\infty} A_n c_H(P_n, t) \sin \frac{\beta_n x}{l} \qquad (29)$$

A graph on page 592, calculated by V. N. Potemkina, containing three curves, shows the influence of hereditary properties of a material on the character of vibration damping process, in caoutchouc, ebonite and steel "5". The fourth curve represents cos $(t-t_1)$. Closing the article, the author expresses his gratitude to Academician G. M. Savin for his contribution. There are 1 graph and 8 references, 6 of which are Soviet, 1 German and 1 Italian.

ASSOCIATION: Dnepropetrovskiy gornyy institut imeni Artema (Dnepropetrovsk Institute of Mining imeni Artem)

PRESENTED: By G. N. Savin, Member, AS UkrSSR

SUBMITTED: January 22, 1959

Card 3/3

16(1)

AUTHOR: Rozovskiy, M.I. SOV/22-12-1-5/8

TITLE: On a Method for the Solution of the Non-Linear Equations of the Theory of Creeping (Ob odnom sposobe resheniya nelineynykh uravneniy teorii polzuchesti)

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR, Seriya fiziko-matematicheskikh nauk, 1959, Vol 12, Nr 1, pp 75-84 (USSR)

ABSTRACT: The author considers the equations of non-linear creeping given by N.Kh. Arutyunyan [Ref 1] :

$$(1)\quad \sigma_x - \sigma = \frac{2\sigma_i}{3\varepsilon_i}\,\varepsilon_x, \ldots\,, \qquad \tau_{xy} = \frac{\sigma_i}{3\varepsilon_i}\,\gamma_{xy}, \ldots$$

$$(2)\quad \varepsilon_i(t) = \frac{\sigma_i(t)}{E(t)} - \int_{\tau_1}^{t} \sigma_i(\tau)\,\frac{\partial}{\partial\tau}\,\frac{1}{E(\tau)}\,d\tau - \int_{\tau_1}^{t} f\left[\sigma_i(\tau)\right]\,\frac{\partial}{\partial\tau}\,C(t,\tau)\,d\tau$$

where $3\sigma = \sigma_x + \sigma_y + \sigma_z$, $E(t) = E_0\,(1 - e^{-\alpha t})$ and σ_i, ε_i

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On a Method for the Solution of the Non-Linear Equations of the Theory of Creeping SOV/22-12-1-5/8

are the intensities of stresses and deformations ; furthermore it is $f(\sigma_i) = \sigma_i + \beta\sigma_i^2$, $C(t,\tau) = \varphi(\tau)\left[1 - e^{-\gamma(t-\tau)}\right]$,

$\varphi(t) = \frac{A}{\tau} + C_0$. In the present paper (2) is solved by the introduction of two operators with the kernels

$$P(t,\tau) = - E(t) \frac{\partial}{\partial \tau} \left[\frac{1}{E(\tau)} + C\ (t,\tau) \right]$$

$$Q(t,\tau) = - E(t) \frac{\partial}{\partial \tau} C\ (t,\tau)$$

For σ_i the author gives several (differently exact) explicit expressions (in the case of an old or young betan etc) . The results are applied in order to calculate the pure shear of a planeparallel layer and the deformation of a tube under

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influence of internal pressure.

There is 1 Soviet reference.

ASSOCIATION: Dnepropetrovskiy gornyy institut imeni Artema (Dnepropetrovsk Mining Institute imeni Artem)

SUBMITTED: April 29, 1958

Card 3/3

Kozovskiy, M.I.

report presented at the 1st All-Union Congress of Theoretical and Applied Mechanics,
Moscow, 27 Jan - 3 Feb '60.

234. G. I. Pshenichnov (Moscow): Large deflections of reinforced shallow cylindrical shells.

235. V. P. Rabinovich (Moscow), Yu. N. Rabotnov (Novosibirsk): Creep strength of turbine discs.

236. A. L. Rabotnikov (Odessa): Flow and consolidation of sands under the action of seepage forces.

237. Yu. N. Rabotnov (Novosibirsk): Creep.

238. R. M. Rappoport (Leningrad): Some problems in the theory of elasticity concerning the design of rock foundations.

239. R. M. Rappoport (Leningrad): Some difference equations of structural mechanics.

240. Kh. A. Rakhmatulin (Moscow): On the propagation of elastic-plastic waves in a half-space.

241. Kh. A. Rakhmatulin (Moscow): Propagation of disturbances in continuous media.

242. V. P. Raiuk (Sverdlovsk): Earth pressure on flexible retaining walls.

243. V. L. Rvachev (Berdiansk): On the pressure of a punch on an elastic half-space.

244. P. A. Rebinder (Moscow): Types of high molecular and dispersion structures and their characteristic mechanical properties.

245. E. Reuss (Budapest): On the influence of the maximum principal stress on the fatigue strength.

246. V. G. Rekach (Moscow): The application of the method of homogeneous solutions to some two-dimensional problems of the theory of elasticity.

247. A. R. Rzhanitsin (Moscow): Some three-dimensional problems of limit equilibrium in rigid, plastic solids.

248. M. I. Rozovskii (Dnepropetrovsk): On the application of the Volterra-Rabotnov principle to Arutiunian's creep theory of concrete.

249. M. I. Rozovskii (Dnepropetrovsk): Some problems of the integral operator theory of creep.

250. A. O. Rzerovtsev (Leningrad): Design of wide-flange beams for bending and temperature effects.

251. D. D. Sapegin (Leningrad): The experimental study of the deformations of rock foundations.

252. O. M. Sapondzhian (Erevan): The determination of the deflections of a simply supported plate by the method of successive approximations.

253. V. S. Sarkisian (Erevan): Torsion of anisotropic prismatic bars of elongated cross section.

254. V. A. Sveklov (Kaliningrad): The impact of a double punch on a half plane.

255. I. V. Svirskii (Kazan): The use of similarity considerations for improving the convergence in the design of shells by successive approximations.

256. A. M. Senkov (Leningrad): Stability of cellular structures built on soft ground.

257. R. V. Serebrianii (Moscow): Bending of thin hinge-joined slabs supported by an elastic layer of finite thickness.

258. B. R. Seth (Kharagpur): Finite bending of plates into cylindrical shells.

259. A. P. Sinitsii (Moscow): A beam on a two-layer half space beyond-the-elastic limit.

260. V. P. Sinidin (Leningrad): Some problems of creep and consolidation of saturated soils.

261. M. G. Slobodianskii (Moscow): Determination of the natural frequencies of plates of constant and variable thickness.

262. N. K. Snitko (Leningrad): Dynamic problems of the design of retaining walls and soil foundations under impact loads.

263. N. K. Snitko (Leningrad): Solution of some dynamic problems of stringer structures by the method of initial parameters.

264. V. V. Sokolovskii (Moscow): On some problems of the theory of plasticity and soil mechanics.

265. M. A. Soponeshch (Petrozavodsk): On a class of solutions of boundary value problems in plasticity.

266. E. S. Sorokin (Moscow): The effect of internal friction on the stresses in beams and plates under impulsive loading.

267. V. I. Spiridonova (Sverdlovsk): Stresses in ellipsoidal shells subjected to internal pressure.

ZORIN, A.N.; ROZOVSKIY, M.I.

Method for the interpretation of the irrational function of an integral operator. Prikl. mekh. 1 no.9:81-88 '65. (MIRA 18:10)

1. Dnepropetrovskiy gornyy institut i Donetskiy nauchno-issledovatel'skiy ugol'nyy institut.

ROZOVSKIY, M.I. [Rozovs'kyi, M.I.]

Poisson's operator coefficient. Dop. AN URSR no.2:197-199 '64.
(MIRA 17:5)

1. Dnepropetrovskiy gornyy institut. Predstavleno akademikom AN UkrSSR G.M.Savinym [Savin, H.M.].

KRUSH, I.I. (Dnepropetrovsk); ROZOVSKIY, M.I. (Dnepropetrovsk)

Forced vibrations of elastically inherent systems. Izv.AN SSSR. Mekh.i mashinostr. no.1:78-82 Ja-F '64. (MIRA 17:4)

ROZOVSKII, M.I.

Integral operator method in the hereditary theory of creep. Dokl. AN SSSR 160 no.4:792-795 F '65. (MIRA 18:2)

1. Dnepropetrovskiy gornyy institut. Submitted July 23, 1964.

KRUSH, I.I. (Dnepropetrovsk); POTEMKINA, V.N. [Pot'omkina, V.M.]
(Dnepropetrovsk); ROZOVSKIY, M.I. [Rozovs'kyi, M.I.]
(Dnepropetrovsk)

Effect of the time factor on the development of very fine cracks in a solid. Prykl. mekh. 9 no.4:438-441 '63. (MIRA 16:8)

1. Dnepropetrovskiy gornyy institut.

ROZOVSKY, M.I. (Dnepropetrovsk)

"Integral operator methods in the hereditary theory of creep"

Report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow 29 Jan - 5 Feb 64.

S/879/62/000/000/026/088
D234/D308

AUTHOR: Rozovskiy, M. I. (Dnepropetrovsk)

TITLE: Effect of the form of edge load on the process of deformation of a plate with a circular inclusion in the presence of creep

SOURCE: Teoriya plastin i obolochek; trudy II Vsesoyuznoy konferentsii, L'vov, 15-21 sentyabrya 1961 g. Kiev, Izd-vo AN USSR, 1962, 186-190

TEXT: Using the results of S. G. Lekhnitskiy (Anizotropnyye plastinki (Anisotropic Plates), GTTI, M., 1957), the author obtains solutions for a rectangular plate as above, with tangential forces uniformly distributed along all 4 sides or with forces applied to 2 sides and resulting in bending moments. Cases of instability are discussed.

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YERZHANOV, Zh.S.; ROZOVSKIY, M.I.

Stressed state of rocks around unsupported mine workings, taking the aftereffect into account. Izv. AN Kazakh. SSR. Ser. mat. i mekh. no.10:3-10 '62. (MIRA 15:9)
(Mining engineering)

ROZOVSKIY, M.I. (Dnepropetrovsk)

An integral equation with a singular kernel. Ukr.mat.zhur. 14
no.2:219-221 '62. (MIRA 15:11)
(Integral equations)

ROZOVSKIY, M.I.

On the problem of creep of an irradiated rod. Izv.AN Arm.SSR.Ser. fiz.-mat.nauk 15 no.4:55-63 '62. (MIRA 15:8)

1. Dnepropetrovskiy gornyy institut.
(Elastic rods and wires) (Creep of materials)

ROZOVSKIY, M.I. [Rozovs'kyi, M.I.]

One class of nuclei and the contact problem of mathematical rheology. Dop. AN URSR no.2:183-186 '62. (MIRA 15:2)

1. Dnepropetrovskiy gornyy institut. Predstavleno akademikom AN USSR G.N.Savinym [Savin, H.M.].
(Rheology)(Operators (Mathematics))

ROZOVSKIY, M.I. [Rozovs'kyi, M.I.]

Equations of the theory of inherent plasticity. Dop.AN URSR no.7:881-884 '61. (MIRA 14:8)

1. Dnepropetrovskiy gornyy institut. Predstavleno akademikom AN USSR F.P.Belyankinym [Bieliankin, F.P.].
(Plasticity)

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S/179/60/000/005/004/010
E081/E135

11.2314

AUTHOR: Rozovskiy, M.I. (Dnepropetrovsk)

TITLE: The Equations of Plane Deformation on Linear Hardening With Time Integral Operators

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Mekhanika i mashinostroyeniye, 1960, No. 5, pp. 80-87

TEXT: The paper is a continuation of previous work (Refs.3, 9, 11). On the basis of a model proposed by A.Yu. Ishlinskiy (Prikladnaya Matematika i Mekhanika, 1941, Vol.5, No.1: Ref.1), the plane elasto-plastic deformation with linear hardening of a compressible material can be represented by a system of springs and dashpots (Fig.1), consisting of three springs with rigidities a_{10}, a_{20}, a_{30}, three viscous elements with relaxation times τ_1, τ_2, τ_3, and an element with Coulomb friction representing the yield value σ_s. The deformation process allowing for the time factor is described by the hereditary type integral equation

$$\sigma(t) = a_{10}\left[\epsilon(t) - \int_0^t \chi_1 \mathrm{Э}_\alpha(-\beta_1;\ t - \tau)\epsilon(\tau)d\tau\right] \quad (1.4)$$

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The Equations of Plane Deformation on Linear Hardening With Time Integral Operators

In order to deal with this equation, the piecewise linear approximation to the S—γ curve is adopted (Fig. 2). This representation is then used to investigate the features of the relaxation process in the elastic zone, and in the plastic zone with hardening. The change with time of the radius of the plasticity zone with hardening near a circular hole cut in an infinite plane and subjected to a pressure applied to the circumference is investigated. The results are expressed in terms of the Э_{α}^{*} operators proposed by Yu. N. Rabotnov (Ref. 2: Prikladnaya Matematika i Mekhanika, 1948, Vol. 12, Part 1), and functions realising these operators.
There are 2 figures and 12 Soviet references.

SUBMITTED: December 15, 1959

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24.4200

AUTHOR: Rozovskiy, M.I. (Dnepropetrovsk)

TITLE: On a class of functions and their applications

PERIODICAL: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 2, no. 1, 1962, 179 - 185

TEXT: A class of functions is considered which permits solving the integro-differential equations for media with aftereffects. Two applications are considered, in which Volterra's principle is used for superposing the influence of the aftereffect on the solution of the homogeneous biharmonic equation and of the nonhomogeneous Laplace equation for anisotropic media. Let H(t, τ) be the resolvent of the kernel R(t, τ). Then the following relation exists between the integral operators H* and R*:

$$\frac{1}{1 - R^*} = 1 + H^* \qquad (1.1)$$

Setting

$$Q(\lambda; t, \tau) = \sum_{\nu=0}^{\infty} \lambda^{\nu} K_{\nu+1}(t, \tau), \qquad Q(\mu; t, \tau) = \sum_{\nu=0}^{\infty} \mu^{\nu} K_{\nu+1}(t, \tau), \qquad (1.3)$$

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one obtains

$$Q^*(\lambda)Q^*(\mu) = \frac{Q^*(\lambda) - Q^*(\mu)}{\lambda - \mu}. \qquad (1.4)$$

Let the integral operators R* and H* have the form

$$R^* = \sum_{k=1}^{m} \xi_k Q^*(x_k), \qquad (1.6)$$

$$H^* = \sum_{k=1}^{m} a_k Q^*(r_k), \qquad (1.7)$$

where the parameters ξ_k and x_k are given. By virtue of (1.1), (1.4), (1.6) and (1.7), one obtains

$$\sum_{k=1}^{m} a_k \left(1 + \sum_{n=1}^{m} \frac{\xi_n}{x_n - r_k}\right) Q^*(r_k) - \sum_{k=1}^{m} \xi_k \left(1 + \sum_{n=1}^{m} \frac{a_n}{x_k - r_n}\right) Q^*(x_k) = 0. \qquad (1.8)$$

From (1.8), it follows that r_k (k = 1, 2, ..., m) are the solutions of equation

$$r^m + \sum_{k=1}^{m} p_k r^{m-k} = 0, \qquad (1.10)$$

where

$$p_k = \sum_{j=1}^{m} \xi_j x_j^{k-1} - \frac{1}{V_{(m)}(x_1, \ldots, x_m)} \sum_{j=1}^{m} x_j^m A_{j;m-k+1} + \frac{1}{V_{(m)}(x_1, \ldots, x_m)} \sum_{n=1}^{m-1} \left(\sum_{j=1}^{m} x_j^m A_{j;m-n+1} \sum_{j=1}^{m} \xi_j x_j^{m-n-1} \right), \qquad (1.11)$$

(where A is the algebraic complement). The coefficients a_k are determined from the equations

$$1 + \sum_{k=1}^{m} \frac{a_k}{x_n - r_k} = 0 \ (n = 1, 2, \ldots, m), \qquad (1.12)$$

with solution

$$a_k = \frac{B_k}{V_{(m)}(r_1, \ldots, r_m)} \qquad (1.13)$$

(B_k being given by an expression involving A and V). Among actual functions which possess the above-mentioned property of $Q(t, \tau)$-functions, Rabotnov's exponential function of fractional order α $(0 < \alpha < 1)$ is mentioned, viz.:

$$E_\alpha(x_k;\ t,\ \tau) = (t - \tau)^{-\alpha} \sum_{n=0}^{\infty} \frac{x_k^n (t - \tau)^{n(1-\alpha)}}{\Gamma[(n + 1)(1 - \alpha)]}, \qquad (1.15)$$

as well as the exponential function of zero order, viz.:

$$E_0(x_k;\ t,\ \tau) = e^{x_k(t-\tau)}. \qquad (1.16)$$

In the following, it is shown that formulas (1.10)-(1.13) are of considerable importance in solving problems in the aftereffect theory of elasticity and heat-conduction of anisotropic media. The deformation is considered of a rectangular plate with a circular insertion, under tangential forces T_0, the aftereffect of the material being taken into account. The formulas for the stresses are

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$$\sigma_r = \frac{E_2}{M} 4T_0 \sin 2\theta, \quad \sigma_\theta = \frac{N}{M} 4T_0 \sin 2\theta, \quad \tau_{r\theta} = \frac{E_2}{M} 4T_0 \cos 2\theta, \tag{2.1}$$

where $M = 3E_2 - \nu_1 E_2 + E_1 + \nu_2 E_1, \quad N = 3E_2 - M.$

Volterra's principle is used; the quantities E_2, M and N are replaced by the operators

$$\overline{E}_2, \quad \overline{M} = 3\overline{E}_2 - \overline{\nu}_1 \overline{E}_2 + \overline{E}_1 + \overline{\nu}_2 \overline{E}_1, \tag{2.2}$$

where

$$\overline{E}_k = E_{0k} [1 - \varkappa_k Q^* (-b_k)] \quad (k = 1, 2), \quad \chi_k > 0, \quad b_k > 0, \tag{2.3}$$

$$\overline{\nu}_k = \nu_{0k} [1 + \gamma_k \chi_k Q^* (-b_k)], \quad \gamma_k = \frac{1 - 2\nu_{0k}}{2\nu_{0k}}, \quad 0 < \nu_{0k} < 0{,}5, \tag{2.4}$$

Now the above-derived formulas are used for obtaining expressions for the operators $\overline{M}$ and $\overline{N}$. Thus, formula (1.4) yields

$$\overline{M} = M_0 [1 - \sum_{k=1}^{2} s_k Q^*(-b_k)]; \tag{2.5}$$

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formula (1.7) yields

$$\frac{1}{\overline{M}}=\frac{1}{M_0}\left[1+\sum_{k=1}^{2}a_kQ^*(r_k)\right], \qquad (2.6)$$

where

$$a_k=(-1)^{k-1}\frac{(r_k+b_1)(r_k+b_2)}{r_1-r_2} \quad (r_1\neq r_2).$$

With $r_1 \neq r_2$, one obtains from (2.1) and (2.6), the formulas

$$\sigma_\theta(t)=\sigma_\theta(0)\left\{1+\sum_{k=1}^{2}\left[\left(1+\sum_{n=1}^{2}\frac{M_n}{b_n+r_k}\right)a_kQ^*(r_k)+\left(1-\sum_{n=1}^{2}\frac{a_n}{b_k+r_n}\right)M_kQ^*(-b_k)\right]\right\} \qquad (2.11)$$

$$\sigma_r(t)=\sigma_r(0)f_1(t), \qquad \tau_{r\theta}(t)=\tau_{r\theta}(0)f_1(t), \qquad (2.12)$$

where

$$f_1(t)=1+\sum_{k=1}^{2}\left(1-\frac{E_{02}\chi_2}{b_2+r_2}\right)a_kQ^*(r_k)-E_{02}\chi_2\left(1-\sum_{n=1}^{2}\frac{a_n}{b_2+r_n}\right)Q^*(-b_2).$$

It was found that in order to eliminate the damaging effect of the time factor, the material of the plate and of the insertion should

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be chosen in such a way, that their rheological characteristics b_k and χ_k, as well as the elastic constants E_{ok} and ν_{ok}, should satisfy 2 inequalities which ensure that the roots r_1 and r_2 are either real negative, or complex with negative real parts. Further, the integro-differential equations is considered which describes the temperature field in an anisotropic body, heat aftereffects being taken into account, viz.:

$$k_1\frac{\partial^2 u}{\partial x^2}+k_2\frac{\partial^2 u}{\partial y^2}+k_3\frac{\partial^2 u}{\partial z^2}+f(x,y,z)+\int_0^t\left[\varphi_1(t,\tau)\frac{\partial^2 u(\tau)}{\partial x^2}+\varphi_2(t,\tau)\frac{\partial^2 u(\tau)}{\partial y^2}+\varphi_3(t,\tau)\frac{\partial^2 v(\tau)}{\partial z^2}\right]d\tau=0; \qquad (3.1)$$

u denotes the temperature field, φ_i - the aftereffect kernel, f - the heat source. Let $\varphi_i = k_i \chi_i Q$, where Q possesses the properties indicated at the beginning of the article. The operator $\bar{k}_i + k_i[1 + \chi_i Q^*(-\beta_i)]$ is introduced; thereby Eq. (3.1) becomes

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$$\bar{k}_1 \frac{\partial^2 u}{\partial x^2} + \bar{k}_2 \frac{\partial^2 u}{\partial y^2} + \bar{k}_3 \frac{\partial^2 u}{\partial z^2} + f(x, y, z) = 0. \qquad (3.3)$$

The solution to Eq. (3.3) is represented as a triple integral involving the operator $\bar{D}$:

$$\bar{D} = C^2\left[1 + \sum_{i=1}^{3} \alpha_i Q^*(-\beta_i)\right] \qquad (3.5)$$

where

$$\alpha_1 = \frac{k_1 l_1^2}{p^2 C^2}, \quad \alpha_2 = \frac{k_2 l_2^2}{q^2 C^2}, \quad \alpha_3 = \frac{k_3 l_3^2}{r^2 C^2}, \quad C^2 = \frac{k_1 l_1^2}{p^2} + \frac{k_2 l_2^2}{q^2} + \frac{k_3 l_3^2}{r^2}.$$

By virtue of above-derived formulas, one obtains

$$\frac{1}{\bar{D}} = \frac{1}{C^2}\left[1 + \sum_{i=1}^{3} \alpha_i Q^*(r_i)\right]. \qquad (3.6)$$

Further, the case is considered when $Q(r, t, \tau) = E_\alpha(r, t, \tau)$, where E is the function defined by formula (1.15). One obtains

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$$\frac{1}{\bar{D}} = \frac{1}{C^2}\left\{1-\sum_{i=1}^{3}\frac{a_i}{r_i}\left[1-E_{1-\alpha}\left(r_i t^{1-\alpha}\right)\right]\right\}, \tag{3.10}$$

where $E_{1-\alpha}$ is Mittag-Leffler's function. By considering the roots of Eq. (3.6), one arrives at the conclusion that the process described by Eq. (3.1) is stable for t ⟶ ∞. There are 5 Soviet-bloc references.

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ROZOVSKIY, M.I.

Some problems in the theory of unsteady creep. Izv. AN Arm. SSR. Ser, fiz.-mat, nauk 14 no.3:97-120 '61. (MIRA 14:8)

1. Dnepropetrovskiy gornyy institut.
(Boundary value problems) (Creep of materials)